

### **REMARKS**

Claims 1-25 are all the claims presently pending in the application. Claims 18-25 have been added.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1, 5, 9, 13 and 15 stand rejected under 35 U.S.C. 101 because the claimed invention is allegedly directed to non-statutory subject matter. Claims 1, 3, 5, 7, 9, 11, 13, 15, and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gruenwald (U.S. Patent No. 6,542,896) in further view of Kojima (U.S. Patent No. 5,604,910) and Modha (U.S. Publication No. 2004/0049503).

Claims 2, 6, 10, 14, and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gruenwald, Kojima, and Modha, and further in view of Turtle (U.S. Patent No. 5,488,725). Claims 4, 8, and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gruenwald, Kojima, Modha, and Turtle, and further in view of Spencer (U.S. Patent No. 5,826,261).

These rejections are respectfully traversed in the following discussion.

#### **I. THE CLAIMED INVENTION**

As described and claimed, for example, by claim 1, the present invention is directed to a method of converting a document corpus containing an ordered plurality of documents into a compact representation in memory of occurrence data.

A first vector is developed for the entire document corpus. The first vector comprises a listing of integers corresponding to terms in the documents such that each said document in said document corpus is sequentially represented in said listing.

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**IN THE DRAWINGS:**

Please revise Figure 9 to add the arrow between elements 906 and 903, as shown in the attachment annotated figure and replacement sheet.

## II. THE REJECTION BASED ON 35 U.S.C. §101

The Examiner alleges that claims 1, 5, 9, and 15 are directed to an abstract idea not tied to a technological art and that the invention described by claim 13 is "... not tangibly embodied in a computer readable/executable medium because a 'program of machine-readable instructions executable by a digital processing apparatus' does not constitute a tangible medium."

Applicants respectfully disagree.

First, relative to the rejection for claim 13, Applicants respectfully submit that the plain meaning of this claim is : "A signal-bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method ...." Applicants respectfully submit that the characterization of this claim (e.g., '... "a program of machine-readable instructions executable by a digitable processing apparatus" does not constitute a tangible medium') by the Examiner is an incorrect interpretation of the plain meaning of the actual claim wording and that one of ordinary skill in the art would readily understand the plain meaning of this claim language as clearly describing that a program of machine-readable instructions is embodied in the signal-bearing medium. Applicants further submit that one of ordinary skill in the art of computer programming would readily understand the metes and bounds of this claim language as clearly claiming a diskette containing the instructions for the described method or a computer memory that has these instructions loaded for execution of the described method.

Second, relative to the rejection for claims 1, 5, 9, and 15, Applicants respectfully disagree with the Examiner. These claims clearly address a method of representing a document corpus containing an ordered plurality of documents into a compact representation in memory of occurrence data. As such, it clearly results "... in a practical application producing a concrete, useful, and tangible result ...." that is comparable to the results of the inventions described in that Court's holdings in the *State Street* and in *AT&T* cases.

Moreover, fully consistent with the guideline at MPEP §2106 2.(b) ii), entitled "Computer-Related Processes Limited to a Practical Application in the Technological Arts",

these claims clearly state: "... representing a document corpus containing an ordered plurality of documents into a compact representation in memory of occurrence data ...." This description is clearly directed to "... a practical application in the technological arts." Thus, contrary to the Examiner's characterization, Applicants submit that the claims are indeed directed to a very specific and clearly articulated practical application in the technological arts.

Therefore, Applicants respectfully request that the Examiner reconsider and withdraw this rejection based on 35 U.S.C. §101.

### **III. THE PRIOR ART REJECTIONS**

The Examiner alleges that Gruenwald, further in view of Kojima and Modha, renders obvious the present invention described by claims 1, 3, 5, 7, 9, 11, 13, 15, and 17 and, when further modified by Turtle, renders obvious the present invention defined by claims 2, 6, 10, 14, and 16. The Examiner further alleges that, when Gruenwald, further in view of Kojima, Modha, and Turtle, is then further modified by Spencer, the present invention described by claims 4, 8, and 12 is also rendered obvious.

Applicants first submit Modha is disqualified as being a prior art reference, if it is assumed that the relevant priority date for that reference is the filing date shown on the front page as the filing date, October 18, 2000, of the parent application 09/690,854. The present application has a US filing date of May 4, 2001. Therefore, under 35 USC §103(c), since the present invention and Modha were commonly-owned (and even share a common inventor) at the time of the invention and Modha would qualify as prior art only under 35 USC §102(e), Modha is disqualified as a prior art reference for purpose of the obviousness evaluation.

Second, Applicants submit that the purpose of Gruenwald and the principle of operation upon which Gruenwald relies upon disqualifies it as a primary reference in a prior art evaluation under MPEP §2143.01: "The proposed modification cannot render the prior art unsatisfactory for its intended purpose" and "The proposed modification cannot change the principle of operation of a reference."

Along this line, Applicants submit that the rejection currently of record mischaracterizes Gruenwald and that the correct characterization would cause this reference to be disqualified as a suitable prior art reference.

More specifically, the Examiner alleges that "... Gruenwald discloses a system, apparatus, data conversion process and method for converting a document or data collection into an ordered, compact representation of occurrences in which a second vector is developed that indicates the location of the document or data in a first vector. (See Gruenwald, Column 17, lines 25-38)."

Applicants respectfully submit that the plain meaning of the claim language is not at all reflected in this "summary" by the Examiner. Applicants further submit that, to one of ordinary skill in the art, the lines 25-38 of column 17 clearly describe merely a sorting process for inserting a new record into an ordered listing. It has nothing whatsoever to do with a second vector.

Applicants further respectfully submit that, contrary to the Examiner's characterization, there is no first vector taught or suggested in Gruenwald that satisfies the plain meaning of the independent claim language. It is noted that the Examiner's interpretation of the claim language is constrained to an interpretation that one of ordinary skill in the art would agree (MPEP §2111).

That is, relative to independent claim 1, the plain meaning first requires that there be a document corpus, which is a term of art meaning that the data be composed of a plurality of documents. Second, at best, as clearly described at lines 44-51 of column 9, the data in Gruenwald is a plurality of records that will each be represented as vectors. Thus, there is no concept in Gruenwald of developing a single vector that represents the entire database, even if the database were to be considered a document corpus.

Indeed, as the lines to which the Examiner points (lines 25-38 of column 17), a key feature of Gruenwald is to be able to freely move the records (e.g., represented as a vector in the intermediate format in which each character is associated with a number from a number system preselected to provide coverage for all the possible characters of interest in the database) around for such operations as sorting and adding new data.

In contrast, a key feature of the present invention is that a single vector of integers represents the entire document corpus. Additional claims define that a second vector and a third vector are also used in the small sparse matrix format described by the present invention.

The advantage of this feature is that, in combination with the second vector and the third vector, the occurrence data is totally preserved while being represented in "small sparse matrix vector form". The present inventors are unaware of any technique that uses less memory and still preserves the information content. The vector records in Gruenwald do not provide a single vector representation of the entire database and, therefore, do not satisfy the plain meaning of the independent claims, let alone provide the reduced memory requirements of a small sparse matrix vector format.

The Examiner cannot simply ignore the basic engineering reality of Gruenwald. Moreover, Applicants submit that Gruenwald cannot be modified to satisfy the plain meaning of the independent without defeating either or both of its purpose or its principle of operation. Therefore, Applicants submit that Gruenwald is even disqualified as being the primary reference for evaluation of the present invention.

Hence, turning to the clear language of the claims, in Gruenwald there is no teaching or suggestion of: "... developing a first vector for said entire document corpus, said first vector being a listing of integers corresponding to terms in said documents such that each said document in said document corpus is sequentially represented in said listing....", as required by claim 1. The remaining independent claims have similar language.

Therefore, Applicants submit that all pending claims 1-25 are clearly patentable over Gruenwald, even if by no reason than dependency.

However, Applicants respectfully submit that the rejection currently of record has other basic and insurmountable flaws.

For example, the plain meaning of the description of the second vector and the third vector, as defined in claims such as 19 and 2 clearly requires that there be a document corpus comprising a plurality of documents, since the second and third vector are defined in terms of units of documents.

Moreover, it is submitted that the rejection currently of record clearly and improperly uses the claimed invention as a roadmap for "picking and choosing" unrelated elements from unrelated inventions in order to arrive at the claimed invention, with no other motivation than to summarily proclaim that one would thereby derive the benefit of having made the modifications. Under this method of evaluation, everything would be obvious.

That is, a claimed combination of elements could always be considered as "merely" a prior art reference, as modified to obtain the benefit of having been modified.

In the rejection currently of record, elements are identified as missing and the missing element is located in a prior art reference. The rejection then summarily alleges that a benefit would accrue to the primary reference by taking words out-of-context from the secondary reference. This simplistic evaluation is devoid of engineering common sense, since it ignores the engineering reality that the primary reference (e.g., Gruenwald) is already perfectly functional for its intended purpose, and the Examiner's task is the modification of this perfectly-functioning system in a manner that one of ordinary skill in the art would reasonably agree improves the system in Gruenwald and is compatible therewith, in that the modification would be possible and would not destroy the purpose and/or principle of operation Gruenwald. The evaluation currently of record fails to adopt this common-sense analysis based on engineering reality.

As pointed out at MPEP §2141.02: *"In determining the differences between the prior art and the claims, the question under 35 U.S.C.103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious"* (emphasis in MPEP itself).

This guideline reflects the well established concept in patentability evaluation that a new invention may "merely" be a new and different combination of known elements.

As also pointed out at MPEP §2143.01: *"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination"* (emphasis in MPEP itself).

Along these lines, Judge Rader seems to clearly admonish against this simplistic evaluation strategy when he wrote in the recent Federal Circuit Court of Appeals holding in *Ruiz v. A.B. Chance Co.*, Federal Cir., No. 03-1333, January 29, 2004:

*"In making the assessment of differences, section 103 specifically requires consideration of the claimed invention "as a whole." Inventions typically are new combinations of existing principles or features. Envtl. Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698 (Fed. Cir. 1983) (noting that "virtually all [inventions] are combinations of old elements."). The "as a whole" instruction in title 35 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might break an invention into its component parts (A + B + C), then find a prior art reference containing A, another containing B, and another*

*containing C, and on that basis alone declare the invention obvious. This form of hindsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result - often the very definition of invention."*

Although the holding in that case left undisturbed, under the "clear error" standard of review, the conclusion of the District Court that the prior art references were properly combinable, it specifically explained that it declined to reverse this conclusion because "... the two references address precisely the same problem ... " (emphasis by Applicants)

This aspect of the *Ruiz* holding, in which precisely the same problem is being addressed by both references, is not present in the prior art references cited in the instant evaluation.

That is, in Gruenwald, as described at lines 52-60 of column 1, the purpose of this reference is to identify and correct "disorder" in a conventional database. To achieve this purpose, Gruenwald converts the raw data of the database into an intermediate encoded form (e.g., by converting the characters into corresponding integers of a number system selected to allow each character of interest in the database to be uniquely associated with an integer) so that mathematical operations can be performed with the character integers in the intermediate format, rather than attempting to work with the characters of the original raw data. It is noted that this approach of using an integer to uniquely represent a character is a principle of operation entirely different from the principle of the present invention in which an integer represents a term found in documents of a document corpus and as associated by a dictionary of terms.

In contrast to the purpose of Gruenwald, the purpose in Modha, as described in paragraph [0005] is to provide "... an automated system that summarizes the large volume of hypertext documents returned during internet searches." To achieve this purpose, Modha constructs a dictionary of words from the documents returned from a query and proceeds to cluster these documents by a vector technique. Applicants submit that one of ordinary skill in the art, given the assignment to improve Gruenwald, would not be attracted to a prior art reference such as Modha that addresses an entirely different purpose and which depends upon representing each character as an integer.

As described at lines 8-12 of column 1, the purpose of Kojima is the detection of a specific character string or keyword, and this purpose is achieved by generating a text vector for a character string. Whether such technique would benefit Gruenwald is irrelevant, since the present invention teaches that each term be represented as an integer and that the entire document corpus be represented by a single vector of such integers. This concept is entirely different from Kojima in which a simple character string is considered as represented by a vector of characters.

As described in the Abstract and at lines 7-61 of column 3, the purpose of Turtle is to improve probabilistic retrieval processing so that retrieved documents are more probable as meeting information needs. Since Gruenwald concerns the analysis of records within a single database to determine disorder, there would be no attraction to a technique such as Turtle that calculates a probability that terms are duplicated, since Gruenwald can make this determination with no question of probability. Moreover, Applicants submit that, contrary to the Examiner's characterization, that one of ordinary skill in the art would find the technique in Turtle as a simplification of any aspect of Gruenwald.

Spencer is also related to determining matches from a query and, therefore, is not reasonably related to determining disorder within a single database. Therefore, Applicants submit that one of ordinary skill in the art would not be attracted to Spencer. Moreover, Applicants submit that a normalization factor indicating a number of occurrences of a term in a document would provide no benefit whatsoever to determining disorder of the records within a single document.

Therefore, Applicants submit that the combinations urged in the rejection currently of record provide any common-sense attempt to modify the primary reference Gruenwald, even if this reference were to be considered as capable of being modified to satisfy the plain meaning of the claim language.

Further, the other prior art of record has been reviewed, but it too, even in combination with Gruenwald, Modha, Kojima, Turtle, or Spencer, fails to teach or suggest the claimed invention.

#### IV. FORMAL MATTERS AND CONCLUSION

Minor errors have been corrected in the disclosure, in accordance with the very helpful comments from Examiner Ries.

The Examiner also objects to Figure 9. The attached drawing correction sheets amends Figure 9 to include an arrow between elements 903 and 906, as requested by the Examiner.

In view of the foregoing, Applicant submits that claims 1-25, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: \_\_\_\_\_

9/13/04



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FIGURE 9

